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MEDICAL EDUCATION, 1924-1926

By

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HOSPITALS OF THE AMERICAN MEDICAL  
ASSOCIATION

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## MEDICAL EDUCATION, 1924-1926

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CONTENTS.—Increase in number of schools, students, and graduates—Enlargement of medical school plants—Capacity of medical schools—Supply of physicians—Better teachers in medical schools—Improved methods of instruction—Greater opportunities for the study of patients—Conditions in 1906—Development of highly technical methods of treatment—Present-day medical course—Advanced courses for specialization—An improved curriculum—Residencies in the specialties—The hospital's part in medical education—Hospitals afford valuable service—Fifty years of medical progress—Medical practice increasingly preventive.

During the past two years changes made in medical schools in the United States have been chiefly in the erection of new buildings, improvement of teaching staffs, the rearrangement of subjects in the curriculum, and closer affiliations with hospitals, with increased opportunities for students personally to study diseases at the bedside in dispensaries and hospitals. Several medical schools are in the throes of erecting enormous teaching plants—a continuation of the marvelous development in this respect during the past several years.

The number of medical schools in the United States fluctuated from 80 in 1923 to 79 in 1924, when the General Medical College of Chicago was discontinued, and back to 80 in 1925 when the University of Rochester School of Medicine and Dentistry was added. In 1926 the charter of the Kansas City College of Medicine and Surgery was revoked, but a new institution was promptly chartered to take its place under the name of the American Medical University of Kansas City.

During the past two years the number of medical students has continued to increase. Instead of only 12,930 in 1919, the number increased to 17,728 in 1924; to 18,200 in 1925; to 18,840 in 1926; and to 19,532 (estimate) in the session of 1926-27.

The number of graduates also increased from 2,529 in 1922 to 3,562 in 1924 and to 3,974 in 1925, but decreased to 3,962 in 1926. Although the number of medical schools has remained at about 80 since 1920, the numbers of both students and graduates have increased. At the beginning of the reorganization of medical schools in 1906 the 162 medical schools then existing enrolled 25,204 students,



an average of 156, and turned out 5,364 graduates, an average of 33. Last year (1926), however, the 79 medical colleges in the United States enrolled 18,840 students, an average of 238, and turned out 3,962 graduates, an average of 50. It is evident, therefore, that,

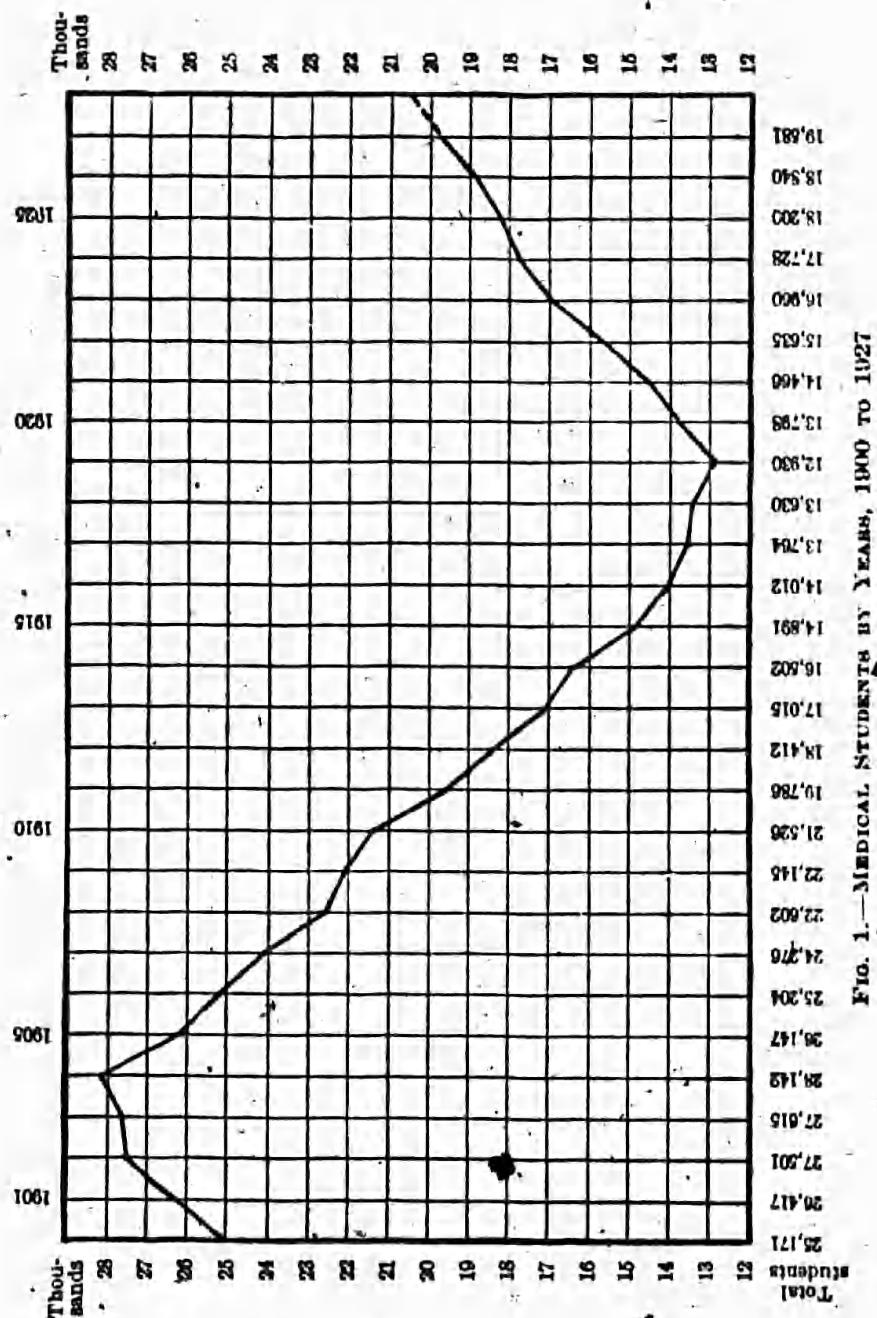


FIG. 1.—MEDICAL STUDENTS BY YEARS, 1900 TO 1927

although the number of schools has been reduced to a more nearly normal supply for this country, the average numbers of students and graduates have been increased. During the past few years, indeed, the medical schools rated in class A have been filled almost to capacity.

## ENLARGEMENT OF MEDICAL SCHOOL PLANTS

The movement toward the building of larger teaching plants, including both medical schools and hospitals, continues.<sup>1</sup> During 1925 and 1926 such enlarged plants have been established and partially completed at the Universities of Colorado, Columbia, Illinois, Ohio, Rochester (N. Y.), Vanderbilt, Western Reserve, Wisconsin, and Meharry Medical College. Those which are nearing completion or are partly occupied are of the Universities of Chicago, Northwestern, Tennessee, and the Detroit Medical College. Medical centers with more modern buildings erected nearer to teaching hospitals are being established by the medical schools of George Washington, Georgetown, and Howard Universities at Washington, D. C., and also by Temple University at Philadelphia.

## CAPACITY OF MEDICAL SCHOOLS

During the past 15 years no medical school has enrolled the enormous classes which were found in several schools in years prior to 1910. "Quantity first" gave way to quality, but even the quantity is being restored. Although the average classes are larger, there has been an increase in the amount of laboratory space, in equipment, and in clinical facilities in dispensaries and hospitals. Since 1912 most of the medical schools have limited<sup>2</sup> their enrollments to the numbers which could be given a satisfactory training in medicine, depending on their varying space, equipment, and hospital relations. This limitation of enrollments has reduced the attendance in a few of the colleges formerly having unduly large enrollments. The capacity of all others remains the same or shows an increase. There has been, however, a tremendous onrush of students into all departments of colleges and universities, including the medical schools; so that, according to some reports, many properly qualified students have sought admission to medical schools who could not be accepted. The reports have been somewhat exaggerated, because many students made applications simultaneously to as high as 15 or 20 medical schools, and some even matriculated in from two to several medical schools in order to be sure of admission somewhere. Only one registration could be filled by one man, and at the opening of the session numerous vacancies remained. A careful survey of the situation indicates that at present the medical schools are filled nearly to capacity, so that if the number of students desiring to study medicine continues to increase the capacity of the medical schools will need to be enlarged or other medical schools established.

<sup>1</sup>See report for 1922-1924, Bulletin July, 1925, No. 31, p. 5.

<sup>2</sup>Enrollments in classes were limited first by Johns Hopkins University Medical School in 1912.



## SUPPLY OF PHYSICIANS

The United States still has more physicians in proportion to its population than any other country. In 1925 there was 1 physician to every 753 people, while Great Britain reports (1921) 1 physician to every 1,087; Switzerland and Japan reported (1925) 1, respectively, to every 1,290 and 1,359; Germany (1912) 1 to every 1,940; Austria (1912) 1 to every 2,120; Sweden (1925) 1 to every 3,500.

The number of physicians for every 100,000 people in each of these countries is shown graphically in Figure 2.

In the United States, as in other countries, there has been a tendency during recent years for physicians to locate in cities rather than in rural districts. There is not a shortage of physicians, as already shown, the problem being one of distribution, because the

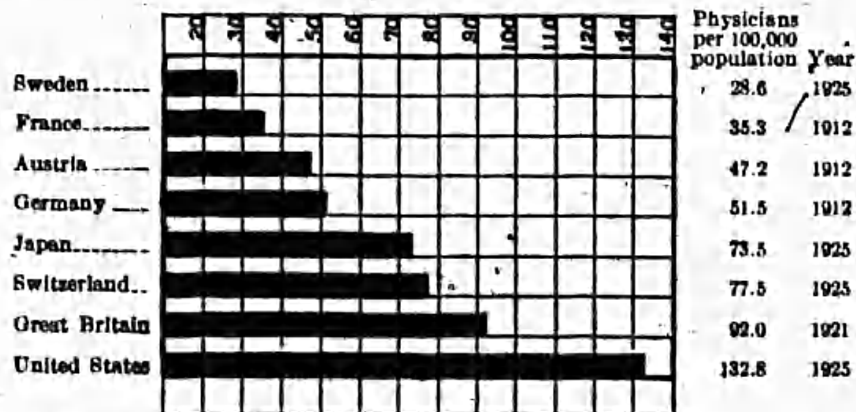


FIG. 2.—RELATIVE SUPPLY OF PHYSICIANS IN THE UNITED STATES AND IN SEVEN OTHER COUNTRIES

excessive supply in cities more than offsets the smaller numbers in rural communities. With the greatly improved means of communication—the telephone, interurban cars, and the automobile—physicians from towns or cities can furnish medical care for much larger districts than formerly. Such complaints as are heard are not of a lack of medical service but of the larger charges for the physician's services because of the greater distance he has to travel. This problem is being studied by country-life associations and others interested in rural communities, with some prospect of improvement. The consolidation of country schools is establishing centers where, in addition to the schoolhouses, small hospitals or health centers may be placed, through which medical service can be obtained in cases of emergency. Through some of the financial foundations, small hospitals are being established in rural districts which have a population sufficient to maintain them.



## BETTER TEACHERS IN MEDICAL SCHOOLS

With the rapid reorganization of medical schools during the past two decades many full-time teachers were employed to provide instruction, chiefly in the fundamental sciences. The urgent demand for such teachers led to the employing of many who had not obtained a training in medicine. Most of these were college graduates, and some had received the degree of doctor of philosophy and had majored in the laboratory science they were employed to teach. The qualifications of teachers have been gradually improved. More have been employed who possess degrees in medicine; others have developed a better appreciation of the essential facts in medical instruction through their association at faculty meetings with physicians teaching in the hospitals. Other teachers have voluntarily obtained medical degrees by working during vacation periods or during leave of absence.

## IMPROVED METHODS OF INSTRUCTION

With the better qualified teachers, methods of instruction in medical schools have also been improved so as to make certain that each medical graduate obtains a thorough knowledge of the normal structure and functions of the human body. Through the greater facilities now provided for the study of sick and injured people in hospitals and dispensaries the student is more thoroughly trained also in the recognition of diseases. In the third and fourth years of the medical course the student, under supervision, gradually assumes more responsibility in the writing of histories, the making of diagnoses, and in recommending treatment of patients suffering from all varieties of diseases and injuries.

Among the later methods of instruction, conferences are held in which the teachers of two or more departments unite in the discussion of complicated cases. These conferences enable the students better to appreciate the value of the basic medical sciences in the study and care of patients. Most common of these are the so-called clinical-pathological conferences, which are held following the deaths of patients from unusual or complicated diseases. In the presence of senior students and physicians the patient's symptoms and conditions previously complained of are discussed, and conclusions reached regarding the chief and contributory causes of death. Then a report of the post-mortem examination is presented which either confirms or corrects the diagnosis advanced in the conference. The findings at autopsies are of extreme value in increasing positive knowledge regarding diseases because medical students and physi-



cian learn better to judge from a patient's complaints what changes of structure or function have occurred. In treating subsequent patients, therefore, they will have greater prospect of checking the progress of the disease. The tremendous value of post-mortems toward the advancement of medical knowledge and the subsequent saving of lives should be generally understood.

#### GREATER OPPORTUNITIES FOR THE STUDY OF PATIENTS

Another important development in medical teaching has been the closer relationship between medical schools, dispensaries, and hospitals. Lectures in the medical curriculum are being limited to those which are essential to outline study courses or relate to more recently established facts regarding the subject. Thus students have more time to develop skill in the examination and treatment of patients under the supervision of teachers in the medical school and physicians in the hospital. A few decades ago only a few medical schools had access to hospitals where an efficient routine of hospital teaching could be developed, but even in these the students had little time for hospital work because the medical course consisted of only two annual sessions of six or seven months each. In some medical schools operations were performed by the professors in the college amphitheaters on patients from the dispensary.

#### CONDITIONS IN 1906

At the beginning of the reorganization of medical schools in 1906, of the 162 medical schools then existing, 94 had no access to hospitals. In 57 schools examination of patients by the professors were occasionally demonstrated in hospital amphitheaters, while in only 11 were students permitted to write histories or make physical examination of hospital patients. After two decades the situation has been greatly improved. Now there are 316 hospitals which are affiliated with medical schools in the training of physicians. There are 50 hospitals which are owned and controlled by university medical schools; and 37 others which, although separately owned, are controlled by the medical schools so far as the care of patients and their use in medical education is concerned; and 40 others provide equally generous privileges. There are, therefore, 127 hospitals in which medical schools are making extensive use of the splendid material for the instruction of medical students—the physicians of the future—and 189 others which are used, but to a less extent.



TABLE 1.—Hospitals used in undergraduate medical education

State	Owned and controlled by the university or medical school	Controlled but not owned by the university or medical school	Generous use of clinical material by the university or medical school	Material moderately well used by the university or medical school	Material occasionally used by the university or medical school	Total
Alabama						
Arizona						
Arkansas						
California	4	1	2	3	2	5
Colorado	2		1	1	2	7
Connecticut		1				1
Delaware						
District of Columbia	2	1	3	2	5	13
Florida						
Georgia	1	2		2	6	11
Idaho						
Illinois	3	5	3	4	13	28
Indiana	2	1		1		4
Iowa	2					4
Kansas	1	1	1		2	5
Kentucky		1			3	4
Louisiana		2	1			3
Maine						
Maryland	2		2	2	3	9
Massachusetts	2	1	3	6	7	19
Michigan	2	1	2	1	2	8
Minnesota	1	1	1	1	2	6
Mississippi						
Missouri	4		1	1	4	10
Montana						
Nebraska	1	1	1	3	3	9
Nevada						
New Hampshire	1					1
New Jersey						
New Mexico						
New York	5	7	7	7	31	57
North Carolina						
North Dakota						
Ohio	2	2	3	4	11	22
Oklahoma	1		1	1	1	4
Oregon	1	1	2	3	4	11
Pennsylvania	4	3	2	6	13	28
Rhode Island						
South Carolina		1				1
South Dakota						
Tennessee	2	1	1	3	4	11
Texas	1	1	2	2	2	8
Utah						
Vermont		1		1	1	3
Virginia	2				3	5
Washington						
West Virginia						
Wisconsin	2	1	1	4	5	13
Wyoming						
Total	50	37	40	60	129	316

A large part of the medical student's time in his third and fourth years is now spent in the study of sick people in dispensaries and hospitals. Following completion of his fourth year, the student now spends a year as an intern in a hospital, doing his work under the supervision of the hospital staff. During these three years the recent graduate studies more patients suffering from a larger variety of



diseases than was possible formerly in the first 10 years of private practice. Guided by their instructors the young physicians now develop skill in the examination and treatment of patients, whereas only a few decades ago most of them immediately after graduation began private practice, where they were entirely without supervision.

#### DEVELOPMENT OF HIGHLY TECHNICAL METHODS OF TREATMENT

Fortunately for the public the methods of treatment 25 or more years ago were more simple and less dangerous than now. With the greatly extended knowledge regarding the causes and progress of diseases, more highly technical methods are now employed in treatment—methods that are highly efficient if administered by expert hands. Various serums and vaccines are now used which render patients immune, or only mildly subject to certain diseases, but may cause great havoc if given by ignorant or unskilled practitioners. The Röntgen-ray and radium, which are so valuable in diagnoses and treatment of patients, may cause untold damage unless administered by skilled hands. In surgery, the knife in expert hands may save lives by cutting away malignant tumors. In the hands of ignorant or careless operators, however, the knife may sever important nerves or other vital structures leading to the immediate death of the patient or rendering him an invalid for life. Medical graduates, in the examination and care of patients 30 or more years ago, could do little harm, even though poorly trained. At present, however, physicians are not qualified to care for the sick unless they have obtained the thorough instruction and developed skill in these technical and essentially dangerous methods of examination and treatment.

#### PRESENT-DAY MEDICAL COURSE

For the safe care of sick and injured people, therefore, a student after graduating from the high school is required to complete seven years of higher collegiate and professional training before he is considered a competent physician. The first two years of work are spent in an accredited college of arts and sciences, where a knowledge of the basic premedical sciences—physics, chemistry, and biology—is obtained. Then the four years in a medical school include instruction in sciences dealing with the normal and abnormal structures and functions of the body; the methods of determining whether or not disease is present, and, if present, what disease it is. He learns also about the various forms of treatment, so he can select the one best fitting the needs of the patient. Following his four years of medical work, the student further continues his work with patients as an interne in a hospital, so that before entering private practice



he will have developed the knowledge and skill necessary for success in the profession which he has selected for his life work.

#### ADVANCED COURSES FOR SPECIALIZATION

The complete course for general practitioners of medicine is rounded out therefore by a year devoted to a rotating interne service in a general hospital in which he obtains experience in both medicine and surgery. This year of interne service has now come to be looked on also as the basis for the two or more years of advanced instruction necessary if the physician intends to practice a specialty.

#### AN IMPROVED CURRICULUM

In the reorganization of medical education, from a simple program of "lectures" there developed a medical curriculum that soon became overcrowded. This curriculum has been considerably revised, but among the subjects are many which deal with rare and complicated forms of disease. These occupy much time which the student can devote better to the study of general principles and to more common types of disease. These more technical subjects are being transferred to the graduate medical schools, where they can be studied later by physicians preparing for specialization.

During the past several years, after careful investigation, a list has been prepared of 41 approved graduate medical schools in which increased knowledge and skill can be obtained in the medical specialties. After investigations by committees made up of specialists, it has been recommended that a physician intending to practice as a specialist, in addition to graduation from a medical school and the completion of an internship in a general hospital, should take at least two or three years of additional training in his chosen field.

#### RESIDENCIES IN THE SPECIALTIES

The most common means of securing higher training leading to specialization is through two or three additional years spent in the large hospitals. In these institutions the practice has been developed of selecting from among the internes those who show special aptitude to serve as house physicians or house surgeons. Their work, indeed, may be further limited to narrower medical or surgical specialties, such as children's diseases; internal medicine; eye, ear, nose, and throat; obstetrics; etc. While in the hospital these are referred to as "residents," and each year, as they attain greater skill, their responsibilities are extended, and increasing stipends are usually paid. In a still incomplete investigation, 284 hospitals have been listed as providing acceptable residencies in the special fields.\*

\* A list of these hospitals appears in the Journal of the American Medical Association, Mar. 12, 1927, the hospital number.



## THE HOSPITAL'S PART IN MEDICAL EDUCATION

The rapid development of medical schools has resulted in an increasingly close relationship with hospitals. Indeed, the hospital is an essential factor in providing material for instruction regarding the cause, cure, and prevention of disease. But the hospital has a larger educational function. Besides the training of nurses, medical students, interns, and physicians within its walls, the hospital can be a center where physicians in the community also can meet for the discussion of patients suffering from unusual or complicated diseases. In this way all the physicians of the community will be kept familiar with the later and improved methods of diagnosis and treatment. The hospital is rendering an even larger service to its community in keeping the public informed regarding methods of preventing disease and maintaining health. This applies not only to people coming to the hospital as patients, but to others also with whom nurses and social-service workers from the hospital come in contact.

## HOSPITALS AFFORD VALUABLE SERVICE

Thus the hospital is providing an increasing service to its community, not only as a place where efficient and skilled service can be obtained in cases of sickness or injury, but also in educating the public regarding the safest and best methods of preventing diseases. Where the hospital has a staff of conscientious and skilled physicians, it is coming more and more to be a haven where people suffering from sickness or injury can go with full assurance that everything possible will be done toward relief of their ailments. If under any circumstances, however, immoral, ignorant, or unskilled practitioners succeed in gaining admission to the staff, instead of being a haven of safety, the hospital will become a place of actual menace to those coming to it for care. Numerous instances could be mentioned where patients treated in hospitals by nonmedical practitioners have not only unnecessarily died, but also where all patients in the hospital have been endangered through the admission to the hospital of patients suffering from unrecognized contagious diseases. The trustees of hospitals, therefore, should see to it that a high standard of morality and professional training and skill is maintained for everyone permitted to treat patients in the hospital. The legal right of hospital trustees to remove from the staff or to refuse to admit anyone who, either morally or educationally, is deemed unqualified to care for sick people, has been invariably upheld by the courts.



## HIGHEST ESSENTIALS IN EVERY HOSPITAL

To maintain in a hospital the highest degree of service to humanity requires that the attending physicians not only possess the essential knowledge regarding the cause, cure, and prevention of diseases, but also have developed a reasonable degree of skill in the recognition of diseases under skilled teachers in the examination and treatment of patients in dispensaries and hospitals. The moral character of the staff should also be maintained to a high degree, and anyone who abuses his hospital privileges should be promptly removed. If these essentials are maintained, the patients' welfare will be safeguarded even though there may be shortcomings in the way of buildings and equipment and in other respects. A staff of conscientious and well-qualified physicians will not only see that the highest service is rendered to the patients but also that the educational function of the hospital will be raised to the highest possible degree.

In addition to what is already being done toward the improvement of its educational function, the hospital's service should be still further extended through the development of the spirit of active research in each institution. Through more post-mortems and more pathologic conferences the accuracy of diagnoses can be checked, and through more research the value of the treatment used can be determined and knowledge regarding other improved methods can be ascertained. Thus the development of clinical research will add greatly to the service which hospitals are already rendering to humanity.

## FIFTY YEARS OF MEDICAL PROGRESS

The statement has frequently been made in recent years in regard to advancement in various scientific fields that "more advancement has been made during the past 50 years than in as many previous centuries" or "in all previous ages." This has been said in regard to the advances in physics, in chemistry, and in astronomy, as well as in speaking of the automobile, the movies, and the radio. The statement is certainly true in regard to the improvements in medical education and medical practice. The microorganisms causing most of the common epidemic diseases have been discovered during the past thirty or forty years, although in two instances the discoveries were made earlier, in 1872 and 1876. The several dates when the origins of common diseases were decided are shown in the accompanying tabulation:

Table 2.—COMMON DISEASES CAUSED BY MICROORGANISMS  
Showing when specific bacterial origin of certain diseases was established<sup>1</sup>

Diseases	Microorganism	Relationship established		Germ discovered		Remarks
		Year	By whom	Year	By whom	
Anthrax (splenic fever)	Bacillus anthracis	1876	Koch	1850	Davaline and Rayer	Knowledge of, greatly added to by Pollender in 1855.
Asiatic cholera	Spirillum cholerae	1883	Koch	1883	Koch	Working independently.
Bubonic plague (black death)	Bacillus pestis	1894	Yersin-Kitasoto	1894	Yersin-Kitasoto	
Cerebrospinal meningitis	Neisseria meningitidis or meningococcus	1887	Weichselbaum	1885	Leichtenstern	
Diphtheria	Bacillus diphtheriae	1884	Löffler	1883	Klebs	First described by Klebs.
Dysentery	Bacillus dysenteriae	1898	Shiga	1898	Shiga	Working together.
Glanders	Bacillus Mallei	1882	Löffler and Schutz	1882	Löffler and Schutz	
Gonorrhea	Micrococcus gonorrhoeae	1879	Neisser	1879	Neisser	Working together.
Infantile paralysis	"Globoid bodies"	1909	Flerner and Lewis	1913	Flerner and Noguchi	Working independently.
Influenza	Bacillus influenzae	1892	Pfeiffer	1892	Pfeiffer and Kitasoto	Staining methods applied by Neisser and Hansen in 1890.
Leprosy	Bacillus leprae	1892	Armauer Hansen	1892	Hansen	Knowledge of, greatly added to by Golgi in 1885.
Malaria	Plasmodium malariae	1880	Laveran	1880	Laveran	
Malta fever	Bacillus melleus	1897	Bruce	1897	Bruce	
Pneumonia	Diplococcus (streptococcus) pneumoniae	1884	Kräkel	1880	Sternberg and Pasteur	
Relapsing fever	Spirochaeta obumbrata	1873	Obermeyer	1873	Obermeyer	Working together.
Syphilis	Treponema pallidum	1905	Schaudinn and Hoffman	1905	Schaudinn and Hoffman	
Tetanus (lockjaw)	Bacillus tetani	1890	Kitasoto	1884	Nicolaier	
Tuberculosis	Bacillus tuberculosis	1884	Koch	1882	Hauimgarten	Germ may have been seen by Villemain as early as 1865.
Typhoid fever	Bacillus typhosus	1884	Gaffky	1880	Eberth	Transmission by mosquitoes suggested by Finlay in 1881; established in 1900 by Reed, Carroll, Agramonte, and Jazez.
Yellow fever	Leptospira icteroides	1918	Noguchi	1918	Noguchi	

<sup>1</sup> This table is presented to show the comparatively recent date when the microorganisms causing these well-known diseases were discovered and their relationship to the diseases established. The authority is Jordan's Textbook of Bacteriology, eighth edition (1924).

<sup>2</sup> Classification among microorganisms is still uncertain.

<sup>3</sup> Investigations during 1918-1920 throw serious doubts on the claim that influenza is caused by Pfeiffer's bacillus.

<sup>4</sup> Malaria and yellow fever have been almost exterminated through the discovery that they are transmitted by mosquitoes, respectively by the Anopheles and the Aedes calopus.

Several fevers, including trench fever, are transmitted by body lice or other insects. The disease known as "sleeping sickness" is transmitted by the tsetse fly. Certain diseases, such as the bubonic plague, are carried from city to city or country by rats. The knowledge of these facts has shown the way of preventing the spread of these diseases.

<sup>5</sup> Weichselbaum's researches, 1896, claimed by some authors as the first actual proof of the causative relation of the microorganism to pneumonia.



These discoveries led to greatly increased knowledge regarding the cure and prevention as well as of the causes of diseases. Great improvements in medical education naturally followed, accompanied by the discovery of increasingly valuable methods of recognizing, curing, and preventing diseases. Many positions which paid fair salaries were established in the field of public health and the prevention of disease. The great epidemics of Asiatic cholera and bubonic plague, which formerly took so great a toll in human lives, are no longer known; the great havoc resulting periodically from diphtheria and smallpox has also been checked—although minor outbreaks still occur occasionally where health measures are ignored. Typhoid fever, formerly causing so many fatalities, as well as being the scourge of armies, has been practically eliminated through the purifying of the water supply and the use of antityphoid vaccination. Well within the public memory are the awful effects of typhoid fever among the American armies during the Spanish-American War, but how different the reports from the World War where, in spite of the millions of soldiers engaged, the deaths from typhoid were so few as to be almost negligible.<sup>4</sup> Through the increased health measures employed in infant welfare the high death rate among infants and children has been tremendously reduced. It is not surprising, therefore, that during the past half century the average expectancy of human life has been increased from 40 to 58 years or, in other words, 18 years on the average added to the life of every individual.<sup>5</sup>

#### MEDICAL PRACTICE INCREASINGLY PREVENTIVE

But equal, if not greater results, may be expected during the next 50 years. The checking of the great epidemics which formerly kept physicians busy has been due to the larger efforts devoted by physicians generally through health agencies and otherwise to the prevention of disease. The future gives promise that physicians can render service by keeping people well rather than by merely curing

<sup>4</sup> Of the soldiers engaged in the Spanish-American War, 1 out of every 7 contracted typhoid fever and 1 out of 71 died of the disease. During the World War, by contrast, only 1 out of 3,176 contracted the disease and 1 out of every 23,641 died. Of the 2,121,390 troops in the United States Army during 1917 to 1919 only 213, or only one-hundredth of 1 per cent, died of typhoid fever. With the rate of deaths which prevailed during the Civil War the number of deaths would have been 51,133, and under the mortality rates of the Spanish-American War the deaths from typhoid fever during the World War would have been 68,164.—From "Typhoid Fever in the American Army during the World War," Frederick F. Russell, Jour. Am. Med. Assoc., vol. 73 (1919), p. 1863.

<sup>5</sup> This statement is based on a comparison of two life tables computed, respectively, in 1855 and in 1898. The first was computed by E. B. Elliott, an actuary for the New England Mutual Life Insurance Co., for 166 cities and towns of Massachusetts. It was published in *Proc. Am. Assoc. for the Advancement of Science* in 1857 and also in the Sixteenth Ann. Rept. Mass. Registration Department. A second table was computed by Dr. Samuel W. Abbott, whose statistics were published in the report of the Massachusetts State Board of Health for 1898.

them when they are sick. There will always be accidental conditions which will require the services of a physician or surgeon, but greater benefits will accrue to the individual if at regular intervals—at least once a year—he undergoes a physical examination, whereby disease processes may be discovered and checked at their very beginning. Under this plan many cases of suffering and illness, sometimes causing actual invalidism, can be prevented. The success of this type of practice depends, however, on the selection by the patient of a physician who is not only thoroughly skilled in making examinations and in recognizing the early stages of disease, but whose integrity is beyond question—one who will not commercialize his opportunity by finding disease where none is present. The public must recognize more than ever not only the importance of knowledge and skill on the part of the physician, but also the absolute danger from the various nonmedical practitioners who nowadays are so commonly assuming the function of a physician and are attempting to use the highly technical methods of treatment, including even dangerous surgical operations—without first securing the physician's training and skill. One does not send a valuable watch to a mechanic or a blacksmith for examination or repairs, but to a skilled watchsmith. How much more important that, for examination or repair, the highly complicated human machine, with its many intricate life processes and delicate vital structures, should be intrusted only to one who is skilled in the use of modern methods of treatment and who knows when and how to use them. Such a training is now available in all of our private or State university medical schools and is recognized in all countries of the world as essential for the efficient care of sick and injured people.

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